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Emily Hartshorne Goodman

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DEFINING WETLANDS FOR REGULATORY PURPOSES: A CASE STUDY IN THE ROLE OF SCIENCE IN POLICYMAKING

BY EMILY HARTSHORNE GOODMAN*

"I think we ought to define a wetland as an area where ducks swim more than they waddle."

*Dean Kleckner, President, American Farm Bureau Federation*¹

"Leave the duck test to the ducks."

*Joseph S. Larson, Director, the Environmental Institute,
University of Massachusetts*²

"The term wetlands is not a term of pure science; it is a term that Congress defined and expected to be interpreted to satisfy a practical, social and political need."

United States v. City of Fort Pierre, 580 F.Supp. 1036, 1038 (D.S.D. 1983), *rev'd on other grounds*, 747 F.2d 464 (8th Cir. 1984).

* J.D. 1993. State University of New York at Buffalo School of Law. This article also appears in the Journal of the Environmental Law Section of the New York State Bar Association, Vol. 14, No. 2 (May 1994).

1. *Implementation of Section 404 of the Clean Water Act: Hearings before the Subcomm. on Environmental Protection of the Senate Comm. on Environment and Public Works*, 102d Cong., 1st Sess. 51 (1991) [hereinafter *Implementation Hearings*] (testimony of Dean Kleckner, President, Am. Farm Bureau Fed'n).

2. *The Status of Wetlands Science: Hearing before the Subcomm. on Environmental Protection of the Senate Comm. on Environment and Public Works*, 102d Cong., 1st Sess. 14 (1991) [hereinafter *Wetlands Science Hearing*] (testimony of Joseph S. Larson, Director, The Env'tl. Inst., Univ. of Mass.).

SUMMARY

Because of the ecological importance of wetlands, they are subject to regulation under federal environmental law. During the presidency of George Bush, two attempts were made to adopt a definition of wetlands establishing uniform criteria that would be applied by all the federal agencies responsible for wetlands regulation. In 1989, those agencies adopted a delineation manual which had not been made available for public comment. The failure to follow the notice and comment rulemaking procedure was justified on the ground that determining wetlands delineation criteria was a technical matter that should be left to experts. Public opposition to the 1989 manual was so great, however, that it was never fully implemented. While the manual adopted in 1989 was criticized for being too inclusive, the revised manual proposed in 1991 was criticized for being too restrictive. Both manuals have now been abandoned. Because it involves value choices as well as scientific expertise, the drafting of a workable delineation manual will require input from scientists, policymakers, and concerned citizens. Government agencies should respect the principle that regulatory policies affecting the public should not be made behind closed doors.

* * * * *

DEFINING WETLANDS FOR REGULATORY PURPOSES

Marshes, bogs and other wetlands have great ecological significance because of the many functions they serve. It is generally recognized that wetlands provide critical habitat for fish and wildlife, including endangered species of animals and plants. Less widely known are the ways in which wetlands contribute to flood control, water purification, groundwater recharge, and reduction of erosion along streambanks and shorelines. Because "wetlands are an integral part of water systems," regulating their use is an essential part of our country's program of environmental

protection.³ Yet every year, the United States suffers a net loss of wetlands through draining and filling for agriculture and other uses. According to the most recent National Wetlands Status Report, between 1974 and 1983 more than a quarter of a million acres of wetlands were lost annually.⁴ In addition, every year many wetlands are degraded by pollution.

The principle that wetlands should be protected is straightforward, but determining which pieces of land are to be protected as wetlands is not. Any federal regulatory policy must be uniform in its application, or it will be perceived as unfair. "Striving for consistency from case to case is essential for equal justice."⁵ The discretion of administrators should be guided by rules that establish "reasonably definite standards," so that like cases will be treated alike.⁶ Thus, a definition of wetlands is needed that can be applied uniformly throughout the United States. On the other hand, wetlands are so variegated that a simple definition will not cover all the different types. Everyone recognizes that a swamp with standing water is a wetland, but what about a meadow that is saturated with water only in the spring? What about land near a stream that floods periodically? How wet must the land be in order to be considered a wetland for regulatory purposes?

The Environmental Protection Agency (EPA) and the Army Corps of Engineers (the Corps) have incorporated into their regulations the same basic definition of a wetland:

3. OFFICE OF WATER, U.S. ENVIRONMENTAL PROTECTION AGENCY, *PROTECTING THE NATION'S WETLANDS, OCEANS AND WATERSHEDS: AN OVERVIEW OF PROGRAMS AND ACTIVITIES* 1 (1992).

4. THOMAS E. DAHL ET AL., *WETLANDS: STATUS AND TRENDS IN THE CONTERMINOUS UNITED STATES, MID-1970'S TO MID-1980'S* 1 (Fish and Wildlife Service, U.S. Department of the Interior, 1991).

5. KENNETH CULP DAVIS, *ADMINISTRATIVE LAW TREATISE* 116 (2d ed. 1978).

6. KENNETH CULP DAVIS, *DISCRETIONARY JUSTICE* 219 (1969).

The term *wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.⁷

This definition is useful only if the meaning of the terms in it are known. In particular, when is the land "inundated or saturated" by water? What vegetation is "typically adapted for life in saturated soil conditions?" What does "prevalence" mean? If there is a ratio of one tree to thousands of tiny marsh plants, which type of vegetation is prevalent?⁸ Applying this general definition to a particular site will require scientific expertise. In addition, policy considerations may enter into the decision to adopt a particular interpretation of a term like "prevalence."

An adequate regulatory definition must do more than enable the government to determine whether a wetland exists on a particular site. It must provide guidelines for determining the boundaries of wetlands, a process called "delineation." The guidelines should be specific enough that variations in delineation from one person to another are minimized; otherwise, the risk of arbitrariness will be unacceptably high. Because of the implications of wetlands delineation for land use, any proposed set of delineation criteria faces opposition from those who think that too much or too little land will be protected from development. For that reason, despite the considerable body of scientific knowledge that has accumulated on the subject of wetlands, the United States government has been unable to adopt uniform delineation criteria. The task of writing a delineation manual that

7. 33 C.F.R. § 328.3(b) (1992); 40 C.F.R. § 230.3(t) (1992).

8. Telephone Interview with Steven Doleski, Regional Permit Administrator, Region 9, New York State Department of Environmental Conservation (May 5, 1993).

can actually be implemented has proved extremely difficult because of unresolved disputes over policy issues.

Landowners generally do not care about the words used by governmental agencies to define a term like "wetland." But they care a great deal about how much of their land is classified as wetlands by the government, since their use of those portions will be restricted. Under § 404 of the Clean Water Act, they are required to obtain a permit from the Corps before using their wetlands for such activities as constructing buildings, harvesting of timber by clearcutting, or disposing of waste.⁹ Thus, the landowner's concern is with delineation rather than with definition. What those dealing with wetlands issues have come to realize, however, is that the definition guides the delineation. The total area of wetlands subject to regulation in the United States is determined by the definition that is adopted.

Writing guidelines for wetlands delineation is usually considered a job for scientists, since no one else has the expertise required. The task is not easy even for experts. As one of the United States Fish and Wildlife Service's leading wetlands scientists has written, "There is no single, correct, indisputable, ecologically sound definition for wetlands, primarily because of the diversity of wetlands and because the demarcation between dry and wet environments lies along a continuum."¹⁰ Since wetlands form a continuum, any definition is arbitrary in the sense that it involves selecting a cutoff point on the continuum, and there will always be arguments for moving that point one way or the other. That is why the issue of defining wetlands for regulatory purposes leads to consideration of questions like, How important are wetlands? How important is it to protect marginal lands with some wetlands characteristics? Are the benefits to society from protecting a particular type of wetland greater than the potential benefits from development? If all wetlands are protected, including those of

9. 33 U.S.C.A. § 1344 (West Supp. 1991).

10. LEWIS M. COWARDIN ET AL., *CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES* 3 (Office of Biological Services, Fish and Wildlife Service, U.S. Department of the Interior, 1979).

lesser ecological value, will the result be development on upland sites of greater ecological value?

These questions cannot be answered without making value judgments. Thus, although scientists may insist that the definition of a wetland should be determined on the basis of scientific expertise, policymakers cannot ignore the value judgments that are involved.¹¹

The federal government may have learned a few lessons about the formulation of natural resources policy from the disastrous course of wetlands regulation policy during the presidency of George Bush (1989-1993). Before 1989, there was little public awareness of wetlands issues, although regulatory programs had been established on the federal level and in many states as well. Four agencies of the United States government shared responsibility for regulating wetlands: the Environmental Protection Agency, the Army Corps of Engineers, the Fish and Wildlife Service (FWS), and the Soil Conservation Service (SCS). Conflicts arose because each agency had its own definition of the term "wetland" and in some respects those definitions were inconsistent. Furthermore, delineation criteria used by the Corps varied from one Corps District to another.¹² Since the definitions were not equivalent, the delineation of wetlands on a particular site depended on which agency's criteria were applied. The lack of a uniform standard was particularly disturbing in light of the fact that the regulatory programs of EPA and the Corps were established to implement the same section of the Clean Water Act, § 404. It became obvious by the late 1980s that a coherent national wetlands policy was needed.¹³

11. Telephone interview with Kenton M. Stewart, Professor of Biological Sciences, State University of New York at Buffalo (May 3, 1993).

12. *Implementation Hearings*, *supra* note 1, at 113 (statement of the Nat'l Wildlife Fed'n).

13. Jon Kusler, *Wetlands Delineation: An Issue of Science or Politics?* *Environment*, Mar. 1992, at 10.

During his presidential campaign, George Bush endorsed the goal of "no net loss" of wetlands. When he became President in 1989, this policy translated into more aggressive enforcement of existing wetlands legislation by federal agencies.¹⁴ During the presidency of Ronald Reagan, a wetlands delineation manual had been drafted by a team of scientists from the four agencies involved in wetlands regulation. The Bush administration hoped that cooperation between the agencies would be facilitated by adoption of the joint manual. Thus, the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* was published in January 1989.¹⁵ Its authors had not arrived at complete unanimity, but they produced a document that the agencies agreed to accept for the sake of uniformity.¹⁶

Public reaction to the new manual was unexpectedly hostile. The new delineation criteria included more land than ever before under the category of wetlands subject to regulation by the federal government. Exaggerated reports appeared in the press, claiming for example that half the state of Vermont would be protected wetlands if the new delineation criteria were implemented.¹⁷ As the opposition gained momentum, Vice President Dan Quayle led the charge, calling the new definition "one of the largest land grabs in modern times."¹⁸ Horror stories abounded, like the one about a developer in Georgia who was ordered to remove two houses he

14. *Id.* at 10.

15. FEDERAL INTERAGENCY COMMITTEE FOR WETLAND DELINEATION ET. AL., *Federal Manual for Identifying and Delineating Wetlands* (1989) [hereinafter 1989 MANUAL].

16. Telephone Interview with Dieter Busch, Chief of Lower Great Lakes Fishery Resources Office, United States Fish and Wildlife Service (May 3, 1993).

17. Richard P. Blessen, *Wetlands Policy Still Unsettled*, NAT'L L.J., Feb. 15, 1993, at 26.

18. Peter Steinhart, *Mud Wrestling*, SIERRA, Jan.-Feb. 1993, at 55, 58.

had built, supposedly without any reason to believe that the site was a swamp. In fact, he was warned prior to construction that the site was a regulated wetland and chose to proceed with construction. As a result, neighboring properties experienced recurrent flooding and the developer was prosecuted by EPA.¹⁹ Some horror stories had no known factual basis, like the one about the lady who was not allowed to plant roses in her garden.²⁰

Inadvertently, the Bush administration had stirred up a hornet's nest. The issue of environmental regulation of private property was joined. As the President of the Farm Bureau Federation put it, "To deny a landowner reasonable and full use of his property, whether it is farming or economic development, is wrong."²¹ The nation's principal oil and gas companies, whose activities necessarily caused alteration of the landscape, took the lead in forming a "National Wetlands Coalition," which actively opposed implementation of the new manual.²²

The propaganda against the manual contained factual distortions and exaggerations, but it was effective, partly because the government was ill-prepared to deal with it. The job of writing the delineation criteria had been undertaken as a scientific task to be performed with accuracy and precision. There is no evidence that anyone in the government was concerned about the reception the manual would receive from the public. No impact statement was prepared to show the potential economic effects of implementing the new guidelines. In particular, it seems that no one had even tried to determine how many acres of land would be classified as wetlands that were not so classified before 1989.

19. *Implementation Hearings*, *supra* note 1, at 136-37 (statement of the Nat'l Wildlife Fed'n).

20. Steinhart, *supra* note 18, at 149.

21. *Implementation Hearings*, *supra* note 1, at 69 (testimony of Dean Kleckner, President, Am. Farm Bureau Fed'n).

22. *Id.* at 89 (statement of the Nat'l Wildlife Fed'n).

As one FWS official has commented, the agencies neglected to involve their "customers" -- the public -- in the decision-making process.²³ No public comment period was provided for the 1989 Manual because it was not considered to embody a new rule. Rather, it was presented as an interpretation of previously existing rules. The government classified the manual as containing "technical criteria."²⁴ The definition of "wetlands" was considered a technical matter which should be left up to the scientists.

If the manual had been classified as a new rule, it would have been subject to the requirements of § 553 of the Administrative Procedure Act (APA), under which a proposed rule is published in the Federal Register and the public is given an opportunity to comment on it. The APA provides that this procedure must be followed when a government agency makes "substantive rules of general applicability" or "statements of general policy or interpretations of general applicability."²⁵ In *Morton v. Ruiz*, the Supreme Court considered an unpublished rule that Indians who did not live on reservations were not eligible for general assistance from the Bureau of Indian Affairs. The court held that the rule fell within the category of "substantive rules" subject to the notice and comment requirement. According to Justice Blackmun's opinion in the *Ruiz* case, the purpose of the procedures required by the APA is "to avoid the inherently arbitrary nature of unpublished *ad hoc* determinations."²⁶

The distinction between substantive and interpretative rules is not always easy to draw. Interpretative rules are said to be

23. Interview with Dieter Busch, *supra* note 16.

24. 1989 MANUAL, *supra* note 15, at i.

25. 5 U.S.C.A. § 552(a)(1)(D) (West 1977).

26. *Morton v. Ruiz*, 415 U.S. 199, 232 (1974).

"rules which merely clarify or explain existing laws."²⁷ An agency may promulgate interpretative rules without providing for public participation because existing law and policy are not changed by issuing such rules.²⁸ It is clear, however, that government wetlands policy was changed by the manuals of 1989 and 1991. Each of those manuals embodied policy choices. The adoption of a particular delineation manual had a legislative effect because the criteria in the manual determined which lands were subject to regulation as wetlands. The category that seems most applicable to these manuals is "interpretative rules with legislative effect," a class of rules not anticipated in the APA.²⁹

So far, however, the courts have not recognized the legislative nature of the delineation manuals. In *Hobbs v. United States*, decided in November 1991, the Fourth Circuit upheld the district court's ruling that the wetlands delineation manual used by EPA was subject to APA notice and comment requirements only if the manual constituted substantive rules rather than interpretive rules. Although the court acknowledged that the 1989 manual resulted in an expansion of EPA's jurisdiction, it held that the manual constituted only interpretive rules. The court was evidently influenced by the argument that the manual was based on "scientific assumptions" and not on any "political motivation or policy consideration."³⁰ EPA and the other agencies cited the *Hobbs* case when the revised wetlands manual of 1991 was published in the Federal Register. The notice included a statement

27. Rayan Tai, *Substantive versus Interpretive Rulemaking in the United States Patent and Trademark Office: The Federal Circuit Animal Legal Defense Fund Decision*, 32 IDEA 235, 238-40 (1991).

28. *Id.* at 238.

29. Kevin W. Saunders, *Interpretative Rules with Legislative Effect: An Analysis and a Proposal for Public Participation*, 1986 DUKE L.J. 346, 381 (1986).

30. *Hobbs v. United States*, 22 Env'tl. L. Rep. (Env'tl. L. Inst.) 20331, 20333 (4th Cir. Nov. 8, 1991), *cert. denied*, 112 S. Ct. 2274 (1992).

that the district court's ruling in *Hobbs* supported the agencies' position that the manual is "a technical guidance document which is not required by law to go through Administrative Procedure Act ... legislative rulemaking procedures."³¹

The agencies justified their position with the statement that the manual "is a technical guidance document and provides internal procedures for agency field staff for identifying and delineating wetlands." They acknowledged, however, that the manual serves "to advise the public prospectively of the manner in which agency personnel will apply the definition of wetlands to particular sites on a case-by-case basis."³² This position is disingenuous, since in some districts the Corps expects landowners to provide a wetlands delineation map with each permit application.³³ These maps are usually prepared by private consultants who rely on the documents produced by the government to guide wetlands delineation. The work of the consultants is then reviewed by the Corps.

When a property contains wetlands, its development is subject to the permit requirement of the Clean Water Act.³⁴ Thus, wetlands delineation criteria will determine whether the owner of that property is subject to a binding legal obligation. Professor Robert A. Anthony argues that the APA legislative rulemaking procedures should be required whenever an agency intends to impose binding obligations on the public.³⁵ Similarly, Professor Kevin W. Saunders maintains that if a rule has legislative effect,

31. 1989 "Federal Manual for Identifying and Delineating Jurisdictional Wetlands;" Proposed Revisions, 56 Fed. Reg. 40446 (1991) (to be codified as 40 C.F.R. 230.3(t) & 33 C.F.R. 328.3(b) [hereinafter 1991 MANUAL].

32. *Id.* at 40446.

33. Kusler, *supra* note 13, at 11.

34. 33 U.S.C.A. § 1344 (West Supp. 1991).

35. Robert A. Anthony, "Well, You Want the Permit, Don't You?" *Agency Efforts to Make Nonlegislative Documents Bind the Public*, 44 ADMIN. L. REV. 31, 34 (1992).

the government should not be able to avoid public participation by labelling it an "interpretative rule."³⁶

With the wisdom of hindsight, Senator George Mitchell observed that "not putting out the 1989 manual for public comment was a mistake."³⁷ Even though the courts have not applied the holding in *Ruiz* to the wetlands manuals put out by Federal agencies, the advantages of the approach prescribed in APA § 553 are apparent. If the comments received show that the proposed rule is offensive to a substantial number of individuals or groups, it can be revised or withdrawn before it is implemented. Withdrawal of a rule after publication is embarrassing to the issuing agency, but not as embarrassing as having to shelve the rule after officially adopting it. The abandonment of the 1989 wetlands manual alienated environmentalists, while those favoring development in wetlands were still annoyed that the manual had been issued in the first place.

The APA is intended to foster effective political participation by citizens, since the public comment period allows for constructive criticism. Adopting a rule without providing for public input may suggest that the government does not care what citizens think, or even that a few bureaucrats are trying to change government policy in a way that they hope will escape public notice. By not holding hearings or soliciting comments, an agency can avoid developing an administrative record that might contain persuasive arguments against the proposed rule. Such a record can provide the basis for judicial review of the agency's decision under the APA.

In the end, there was a "public comment period" of sorts for the 1989 manual, even though it had not been officially adopted. Because of the outcry that followed its release, the Corps held

36. Saunders, *supra* note 29, at 383.

37. *Implementation Hearings*, *supra* note 1, at 275 (statement of Senator George Mitchell).

hearings on the manual in 1990, more than a year after it was issued.³⁸

The delay was unfortunate, but otherwise it was as if the Corps were following the recommendation made by the Administrative Conference of the United States (ACUS) in 1976 that agencies voluntarily invite the public to submit comments after a nonlegislative rule is adopted.³⁹

Meanwhile, bills were introduced into Congress that would have diminished federal jurisdiction over wetlands. The atmosphere in which revisions of the manual were being prepared became so politically charged that the chief ecologist in EPA's wetlands division resigned from the team.⁴⁰ As one observer has noted, "the team working on the manual, which at one time consisted almost entirely of scientists, gradually became a team of lawyers and administrators."⁴¹

On Aug. 14, 1991, a new version of the wetlands manual was published in the Federal Register. Relying on *Hobbs*, the government stated that it had no obligation to follow the notice and comment procedure. Nonetheless, the notice indicated that the proposed manual was being published "in order to foster public participation in the Manual revision process."⁴² A 60-day comment period was announced. Thus, the agencies sought the benefits obtainable from communicating with the public without acknowledging any obligation to submit "technical guidance documents" for public comment.⁴³ During the comment period,

38. 55 Fed. Reg. 24138 (1990).

39. Michael Asimow, *Nonlegislative Rulemaking and Regulatory Reform*, 1985 DUKE L.J. 381, 421 (1985).

40. Marguerite Holloway, *High and Dry: New Wetlands Policy Is a Political Quagmire*, SCI. AM., Dec. 1991, at 16.

41. Kusler, *supra* note 13, at 29.

42. 1991 MANUAL, *supra* note 31, at 40446.

43. *Id.* at 40446.

which was eventually extended to January 21, 1992, comments were received from more than 100,000 persons.⁴⁴

The 1989 manual was criticized by such groups as the industry-backed National Wetlands Coalition on the ground that its delineation criteria were too inclusive. The 1991 manual was written to meet their objections.⁴⁵ Its guidelines were intended to be strict enough that the acreage of land to be regulated as wetlands would be reduced significantly below the amount regulated under the 1989 guidelines.⁴⁶ A new chorus of objections arose, this time from environmentalists, who charged that "rather than scientific precision . . . at stake for this administration is a desire to please the big business interests who want to get on with drilling, plowing, and paving these areas with impunity."⁴⁷

The agencies moved more cautiously in 1991 than in 1989. The notice in the Federal Register announced a public comment period for the revised manual and stated that "an independent testing panel," as well as scientists from federal agencies, would test it in the field.⁴⁸ But the independent "blue ribbon panel" promised by EPA Administrator William K. Reilly proved impossible to constitute.⁴⁹ William J. Mitsch, a university professor specializing in wetland ecology, agreed to chair the panel, but he was told that the persons he initially proposed as members were not "appropriate." He then submitted a list of 23 prominent

44. Memorandum of Agreement Concerning the Determination of the Geographic Jurisdiction of the Section 404 Program, 58 Fed. Reg. 4995 (1993).

45. 56 Fed. Reg. 8560, 8561-8580 (1991).

46. 1991 MANUAL, *Supra* note 13, at 29.

47. Jessica Landman, *Bad Day for Ducks*, AMICUS J., Fall, 1991 at 3.

48. 1991 MANUAL, *supra* note 31, at 40448.

49. *Implementation Hearings*, *supra* note 1, at 264 (statement of William K. Reilly, Administrator, Environmental Protection Agency).

wetland scientists and resource managers. After more than a month went by and not a single nominee was approved, he resigned from the panel.⁵⁰

In a statement submitted to a Congressional committee shortly thereafter, Professor Mitsch made it clear that he did not blame EPA for the difficulties he experienced. Rather, he had been told that approval of the nominees had been referred to the Office of Management and Budget (OMB) "and elsewhere" -- probably to Vice President Quayle's Council on Competitiveness, which had played an active role in the development of the 1991 manual.⁵¹ Mitsch had heard a rumor that some of his nominees were ruled out because they had made public statements critical of the manual. He resigned partly because the panel "would lack credibility among the scientific community" due to the way it was being selected.⁵²

EPA's Reilly found himself in a difficult position. The version of the 1991 manual that was published was not the one prepared by EPA, but a revision reflecting the priorities of OMB and of the Council on Competitiveness.⁵³ Reilly's hope of validating the new manual through independent scientific testing was frustrated by the political impossibility of constituting a credible panel. As Reilly had promised, field tests were carried out by teams of scientists from the federal agencies concerned with wetlands regulation, but the results were never released. Apparently publication was barred because the results were embarrassing to the Administration. Senator Max Baucus,

50. *Id.* at 434-35 (statement of William J. Mitsch, Ph.D.).

51. *Id.* at 434-35 (statement of William J. Mitsch, Ph.D.); Kusler, *supra* note 13, at 29. For a critical discussion of the role of the OMB in agency rulemaking, see Alan B. Morrison, *OMB Interference with Agency Rulemaking: The Wrong Way to Write a Regulation*, 99 HARV. L. REV. 1059 (1986).

52. *Implementation Hearings*, *supra* note 1, at 435 (statement of William J. Mitsch).

53. Kusler, *supra* note 13, at 29.

Chairman of the Subcommittee on Environmental Protection of the Senate Committee on Environment and Public Works, obtained the findings of the review teams, which he summarized as follows:

In many regions, from 30 percent to 80 percent of the Nation's freshwater wetlands will lose protection if the proposed changes go into effect. And, it will take four to five times as long to actually delineate a wetland using this revised manual.⁵⁴

Supporters of the 1991 manual, such as the Farm Bureau Federation, argued that "all the proposed revisions do is to discontinue calling areas wetlands that do not truly function as wetlands."⁵⁵ But the weight of expert opinion was against the new guidelines.

The horror stories told in response to publication of the 1991 manual reflected fears that wetlands protection programs would be gutted under the new guidelines. Although the field test results were never officially released, leaks enabled the publication of newspaper articles such as one in the *Miami Herald* that claimed federal protection would be lost for many wetlands, including vast sections of the Everglades and most of Virginia's Great Dismal Swamp. The article quoted an attorney of the Sierra Club Legal Defense Fund as saying that withholding the field test summaries was a violation of the Freedom of Information Act.⁵⁶ Meanwhile scientists employed by state agencies were making their own studies. The Governor of New Jersey wrote Senator Baucus that field testing by his state's Department of Environmental Protection and Energy indicated that under the new guidelines the amount of

54. *Implementation Hearings*, *supra* note 1, at 343 (statement of Senator Max Baucus).

55. *Id.* at 352 (statement of Mark Maslyn, Assistant Director for National Affairs, Am. Farm Bureau Fed'n).

56. *Id.* at 370-71 (Heather Dewar, *Wetlands Studies Kept Secret*, reprinted from the *MIAMI HERALD*, Nov. 16, 1991).

protected wetlands in New Jersey would be cut nearly in half. He declared that "the proposed changes are a scientifically flawed, thinly disguised attempt to shrink the amount of wetlands subject to protection."⁵⁷ Leaders of the environmental bar in New York City wrote to the Director of EPA's Wetlands Division, "We are concerned that the Proposed Rules would open vast acres of previously protected wetlands to use by developers, farmers, or builders."⁵⁸

As a result of the controversy over the 1991 manual, it was never adopted. An attempt was made to revive it in December 1991, when proposed changes to the Code of Federal Regulations that would implement the manual were published in the Federal Register.⁵⁹ No further action was taken during 1992, however, presumably because of the presidential election. Politically, the wetlands issue had become an embarrassment for the Administration. When President Bush left office, the federal government still did not have a coherent policy on wetlands regulation. Officially, government agencies were still reviewing the comments made in response to the notices published in the Federal Register in August and December, 1991.

Congress responded to the controversy over wetlands delineation manuals by requiring the Army Corps of Engineers, the agency most active in regulating wetlands, to employ the delineation criteria contained in a manual the Corps had developed in 1987. On January 19, 1993 the EPA and the Corps published a notice in the Federal Register indicating that both agencies would adhere to the 1987 manual "until a notice and comment rulemaking was completed on a revised manual." The notice also announced

57. *Id.* at 448 (letter of Jim Florio, Governor of New Jersey).

58. Letter from Stephen L. Kass, Chair, Special Committee on International Environmental Law, and Gail S. Port, Chair, Committee on Environmental Law, Association of the Bar of the City of New York, to Mr. Gregory Peck, Director, Wetlands Division, Environmental Protection Agency (Jan. 17, 1992)(on file with author).

59. Wetland Identification and Delineation Rule, 56 Fed. Reg. 65,964 (1991).

that EPA was contracting with the National Academy of Sciences (NAS) "to prepare a scientific analysis of wetlands delineation, including an evaluation of the scientific validity and practicability of existing wetland delineation manuals."⁶⁰ Congress had appropriated \$400,000 for the NAS study, which is intended to serve as a preliminary step toward the preparation of a new manual.⁶¹ After the failure of manuals written by small groups within the federal agencies, officials have apparently realized that they must do something to obtain more input and to give their efforts more credibility with the public.

The failure of the federal government to produce a wetlands manual that could command broad support was not the fault of the scientists who worked on drafting the manuals. They were not asked to consider the social or economic impact of the criteria they drafted. As can be seen from a comparison of the 1989 and 1991 manuals, the parameters of wetlands definition can be adjusted to produce widely varying results. The definition employed in the 1989 manual is summarized as follows:

Wetlands possess three essential characteristics: (1) hydrophytic vegetation; (2) hydric soils and; (3) wetland hydrology, which is the driving force creating all wetlands. These characteristics and their technical criteria for identification purposes are described in the following sections. The three technical criteria specified are mandatory and must all be met for an area to be identified as wetland.⁶²

This definition begs the question, in the sense that the three key terms in it are not defined. The rest of the manual is devoted

60. Memorandum of Agreement Concerning the Determination of the Geographic Jurisdiction of the Section 404 Program, 58 Fed. Reg. 4995 (1993).

61. Steinhart, *supra* note 18, at 150.

62. 1989 MANUAL, *supra* note 15, at 5.

to specifying the meaning of those terms. Thus, the definition is followed by 55 pages of text, 27 pages of references, a glossary of 11 pages, and 20 pages of sample data sheets and computations. This format does not make the manual "user-friendly." Furthermore, the user needs information that is not in the manual in order to apply its guidelines. For example, the manual does not include a list of "hydrophytic vegetation," but the user is told to consult the "National List of Plant Species That Occur in Wetlands" published by FWS. Similarly, the user is referred to the hydric soils list and soil survey maps prepared by the Soil Conservation Service and to hydrologic data available from various government sources.⁶³ As one author advised real estate lawyers, delineating a wetland is a complex task "requiring specialized skills and expertise."⁶⁴

According to the 1989 manual, "the driving force creating wetlands is 'wetland hydrology,' that is, permanent or periodic inundation, or soil saturation for a significant period (usually a week or more) during the growing season."⁶⁵ Wetlands are the portion of the landscape that provides storage of water for a long enough time to create anaerobic conditions in the soil. Thus, hydrology is fundamental; wetlands soils and vegetation are the consequence of the presence of water. As an environmental consultant has pointed out, however, it is impractical to use hydrology as the sole defining characteristic of wetlands. Since inundated or saturated conditions may be transient, hydrology is difficult to determine by direct observation. For that reason, vegetation and soils are also considered -- parameters that are more easily observed and that reflect hydrologic conditions.⁶⁶

63. *Id.* at 5, 12-13, 16.

64. Richard S. Hawrylak, *What You Should Know About Wetlands*, PRAC. REAL EST. LAW, Jan. 1991, at 62.

65. 1989 MANUAL, *supra* note 15, at 15.

66. Interview with Garrett Hollands, Wetlands Consultant with Fugro-McClelland (Feb. 24, 1993).

Although the 1989 manual specifies that all three of the "essential characteristics" listed in the definition must be present to justify delineation of a wetland, it allows for certain presumptions to be made. In particular, in an area where there is no visible evidence of "significant hydrologic modification" and where hydrophytic vegetation and hydric soils are observed, "wetland hydrology is presumed to occur."⁶⁷

In contrast, the 1991 manual allows no such presumption. The same three parameters are used, but each must be determined separately. Furthermore, the hydrological criteria are more stringent. Instead of inundation or saturation lasting a week or more during the growing season, the 1991 manual requires evidence of inundation for 15 or more consecutive days or saturation to the surface for 21 or more consecutive days during the growing season in most years.⁶⁸ As we have seen, this seemingly minor change in the rule diminished considerably the acreage that would have been delineated as wetlands if the manual had been implemented.

Both manuals are based on the same body of scientific knowledge. Both use the same three parameters in defining a wetland. It was reported that the 1991 manual was rewritten to reflect the priorities of the Vice President and his associates in the Council on Competitiveness.⁶⁹ But were those critics justified who called that manual "unscientific?" What did they mean by the epithet?

An examination of the rhetoric used in the debate over wetlands regulation reveals that environmentalists and scientists espoused the ideal that wetlands delineation criteria should be determined on a scientific basis. In the Senate hearings regarding revision of the federal wetlands manual, the environmental community generally supported the 1989 manual as a "scientifically-correct document," while admitting that it could be

67. 1989 MANUAL, *supra* note 15, at 17.

68. 1991 MANUAL, *supra* note 31, at 40452.

69. *Notes and Comment*, THE NEW YORKER, Dec. 16, 1991, at 39.

improved.⁷⁰ The scientists who testified were generally critical of the 1991 manual. A biologist criticized the hydrologic criteria of the new manual as "unscientific and unrealistic and undefensible." He stated, "Scientists know what wetlands are."⁷¹ A state wetland manager charged that "the proposed changes replace criteria based on science with arbitrary standards . . . [that] cannot be adequately explained or defended."⁷² A wetland ecologist complained that revision of the manual was motivated by "a desire to reduce the scope of Federal wetland jurisdiction. Thus, policy issues have been confused with science."⁷³

Those supporting the 1991 revisions generally insisted that the policymaker has a legitimate role to play in formulating regulatory criteria. A representative of the Farm Bureau Federation declared, "It is not that science is lacking in the wetland debate but a clear and rational policy to apply that science."⁷⁴ Similarly, the Chairman of the Council on Environmental Quality under President Bush, Michael R. Deland, justified the 1991 wetlands manual as follows: "There admittedly were some policy judgments made. . . . But there is no scientific consensus on this issue, as there seldom is on any environmental issue."⁷⁵ From their point of view, "the abundance of wetland definitions" showed that "the definition of

70. *Implementation Hearings*, *supra* note 1, at 24 (statement of Steve Moyer, Legislative Representative, Nat'l Wildlife Fed'n).

71. *Id.* at 346 (statement of David Cooper, Senior Research Scientist, Dep't of Fishery and Wildlife Biology, Colo. State Univ., Fort Collins, Colo.).

72. *Id.* at 348 (statement of Scott Hausmann, Chairman, Ass'n of State Wetland Managers).

73. *Id.* at 361 (statement of Francis Golet, Professor, Dep't of Natural Resource Science, Univ. of Rhode Island, Kingston, R.I.).

74. *Id.* at 353 (statement of Mark Maslyn, Assistant Director for National Affairs, Am. Farm Bureau Fed'n).

75. Holloway, *supra* note 40, at 20.

wetlands is a policy question that should be decided by politicians and administrators rather than by scientists."⁷⁶

Senator Chafee, the ranking Republican member of the subcommittee holding the hearings, tried to sort out the issues as follows:

One approach is to take the scientific definition of a wetland, challenging and onerous though it might be, start with that and then if you want to retreat from that for policy matters, then that's something Congress can do. It seems to me what you folks are suggesting is that you don't like the definition of wetlands.... You're saying you don't like the results and so get those scientists to back off from this definition. My judgment is have the delineation manual set what is a wetland and if we don't like that, then we can step back and say, they say if it's wet for 7 days a year, then it's a wetland. No, well, O.K., make it 14. We'll change it for policy reasons, but don't try and argue with the science.⁷⁷

There are two models here. According to one, which Senator Chafee apparently accepts, there is one definition of a wetland that is scientifically correct, and any deviation from that is either a mistake or a distortion due to a motive external to science. According to the other model, since there is a lack of consensus among scientists on defining wetlands, policy considerations will necessarily enter into the choice of a definition and the formulation of delineation criteria.

Scientists find it shocking that "political" considerations should enter into the choice of a wetlands definition. But politics is one way to resolve conflicts over resources. As we have seen,

76. Kusler, *supra* note 13, at 10.

77. *Implementation Hearings*, *supra* note 1, at 43 (statement by Senator John H. Chafee).

how wetlands are defined for regulatory purposes has far-reaching implications for land use and for future water supplies. It is unrealistic and self-defeating to pretend that conflicts of this kind can be dealt with by means of documents drafted by experts behind closed doors, whether they are experts on wetland ecology or on public policy. If legislation is not required, then at least the notice and comment rulemaking procedure should be followed, so that the public has a chance to participate.

When the scientific witnesses before the Senate subcommittee protested that the 1991 manual was "unscientific," what did they mean? In part, they meant that insufficient justification was given for the new delineation criteria. But in addition, they disagreed with the policy choice that had been made in drafting the new guidelines. They were aware of the many tracts of land which served wetlands functions but which would no longer be protected by the Clean Water Act permit requirements. Thus their protest reflected the fact that they valued certain functions of wetlands more than the drafters of the manual did. Since the final version was not prepared by scientists, it is possible that the drafters were ignorant of those functions. This seems unlikely, because of the many interactions that apparently took place between government scientists and the policymakers who wrote the final version. More likely, values such as the right of property owners to do what they want on their own land and the right of corporations to engage in profitable enterprises were uppermost in the minds of the policymakers.

Should scientists be expected to anticipate the political consequences of their work when they participate in the regulatory process? A biology professor who is well-informed on public affairs maintains that it is up to the politicians to ask their scientific advisors the questions that are politically significant.⁷⁸ In 1989 and in 1991, wetlands delineation manuals were published before any careful estimate had been made of the acreage affected by the new regulatory regime as compared to the pre-existing one. Surely

78. Telephone Interview with Brian Shero, Professor of Biology, Medaille College, Buffalo, N.Y. (May 3, 1993).

the preparation of such an estimate should have been considered part of the job of drafting the delineation criteria. If the scientists did not realize that, officials concerned with policy issues should have done so.

Natural resources policy cannot be dealt with in isolation from other aspects of national policy. When President Bush committed his administration to the "no net loss" goal, he apparently had very little understanding of its implications. Perhaps he was thinking primarily of large wetlands frequented by migratory waterfowl. Protection of such areas was popular among his sportsman friends. Clearly, he was not prepared for the negative response to the manuals proposed by his administration in 1989 and 1991. A greater awareness of the value choices involved in determining wetlands policy might have helped Bush realize that formulating acceptable delineation criteria would require a process of accommodation between competing interests.

The Clinton-Gore administration can make a fresh start on the wetlands delineation issue, since the previous manuals were developed under Republican presidents. They should avoid the mistake of entrusting the preparation of a new manual entirely to government scientists. Nor should they allow a group of lawyers and administrators to rewrite the manual in a way that cannot be justified scientifically. The National Academy of Sciences study which is underway is intended to provide the foundation. To provide input into the drafting, according to the Executive Director of the Association of State Wetland Managers, the new administration should create an advisory task force including representatives "from all of the major interest groups including state and local governments."⁷⁹

Wetlands scientists should write the first draft of the delineation criteria. The drafting team should include economists qualified to prepare an analysis of the impact of the proposed criteria. The team should also be asked to prepare an analysis of the impact of shifting the parameters in ways that would make the

79. Jon Kusler, Proposed Wetland Regulation Strategies for the Clinton/Gore Administration (unpublished position paper, 1993).

definition more or less strict. Then, policymakers should be asked to provide a broad social and economic perspective that clarifies the value choices involved. Skilled technical writers should be employed to render the manual as clear and as practical to use as possible. Before the release of the completed manual, the President, or his close advisers, should be advised of the choices that were made so that he may decide whether they are consistent with his overall policy. In addition, the procedure used in 1991 should be followed: publication in the Federal Register, a comment period, and field studies conducted by government scientists and others.

Science cannot provide society with magical formulae that will cause conflicts to disappear. On the other hand, policymakers seeking to resolve conflicts over natural resources need the help of knowledgeable scientists to understand the implications of various policy choices. The recent history of wetlands regulation in the United States suggests that our government officials need a better understanding of the role that scientific advisors can and should play in the policymaking process. Furthermore, the limitations of scientific expertise must be recognized so that the door is opened to citizen input on issues such as wetlands delineation. Finally, when value choices are involved the claim that "science is on my side" should not be credited. Once the proper role of science in policymaking is recognized, then our leaders will be able to steer between the Scylla of a science divorced from social considerations and the Charybdis of a process of policy formation that excludes scientific insights.

